



Division of Waste Management

Michael F. Easley, Governor  
William G. Ross Jr., Secretary  
Dexter R. Matthews, Director

June 5, 2003

Mr. Jamie VanBuskirk  
Corporate Remediation Group  
DuPont Engineering  
6324 Fairview Road  
Charlotte, NC 28210

Re: Site Conceptual Model/Groundwater Flow Directions  
RCRA Phase I Report--DuPont Fayetteville Works  
DuPont Fluoroproducts - Fayetteville Works  
EPA ID # NCD 047 368 642

Dear Mr. VanBuskirk:

Part of the May 29<sup>th</sup> telephone conversation between DuPont's Corporate Remediation Group (CRG) and the Hazardous Waste Section (HWS) focused on the groundwater flow aspect of the DuPont-Fayetteville facility's site conceptual model. As pointed out by the CRG, subsurface data indicates that the groundwater flow direction in the vicinity of the Former Fire Training Area is toward the southwest. The groundwater flow direction at SWMUs 9A and 9B (Former WWTP Lagoons) is in the same direction. However, groundwater flow in the area of SWMU 6-Process Sewer System is toward the northeast and in the direction of the Cape Fear River.

The HWS believes the groundwater flow directions at the units listed above are accurate interpretations of the subsurface data. The topography in this area of the facility is relatively flat, and Section 5.1.2 of RCRA Phase I Report--DuPont Fayetteville Works seems to imply that these flow directions are influenced by the dip of a clay layer which lies beneath the entire site. During a site visit in May 2002, however, there was a brief discussion about the control a channel located west of the former WWTP lagoons could have on the direction of groundwater flow at these units (i.e., SWMUs 9A, and 9B).

In an unconfined aquifer, a groundwater divide can develop between two channels (or canals) even in the absence of significant topography. The height of such a groundwater divide

1646 Mail Service Center, Raleigh, North Carolina 27699-1646  
Phone: 919-733-4996 \ FAX: 919-715-3605 \ Internet: [www.enr.state.nc.us](http://www.enr.state.nc.us)

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and its location would be controlled by aquifer properties, distance between the channels, hydrostatic heads at the channels, and recharge to the aquifer. Analytical solutions have been derived which express this concept mathematically.

Since a groundwater divide could profoundly influence the distribution of contaminated groundwater, the HWS recommends that the CRG expand its site conceptual model to include discussions of the groundwater flow reversals documented in the Phase I RFI report. As an explanation for the location and likely areal extent of the divide, the influence of a western channel should be considered. However, this is just one of several hypotheses that could explain the different groundwater flow directions documented at the site. DuPont-Fayetteville and the CRG should select the hypothesis which, in their judgment, best fits all the data.

Concerning a separate topic, the "Nafion channel" was also discussed during the site visit of 2002. It was proposed that this channel could intercept contaminated groundwater originating in the Nafion area before it reached the Cape Fear River or was discharged at downgradient springs. The fact that this theory was developed should be mentioned in the Phase I report. In addition, data collected during Phase I investigations which may help define the role of the channel in the local groundwater flow regime should be discussed.

Hopefully, this letter will prove to be a useful follow-up to our recent telephone conversation. If your office has questions concerning this correspondence, please call me at (919) 733-2178 extension 236.

Sincerely,



Larry Stanley  
Hydrogeologist  
Hazardous Waste Section

cc: Narindar Kumar, US EPA, Region 4  
Bobby Nelms  
Michael Johnson, DuPont Fayetteville Works  
Larry Stanley

rc: Bud McCarty  
Bob Glaser  
Karim Pathan  
Larry Stanley